



Chesterfield County, Virginia Utilities Department

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A GUIDE TO THE SELECTION, INSTALLATION AND MAINTENANCE OF BACKFLOW PREVENTION ASSEMBLIES AND DEVICES FOR GENERAL COMMERCIAL AND INDUSTRIAL APPLICATIONS

The table below summarizes the general use, installation and maintenance requirements of the most commonly used backflow prevention methods, assemblies and devices. It does not include all types, uses and requirements for each method, assembly or device. The applicable regulations, codes and technical guidelines as well as the assembly or device manufacturer's literature should be reviewed for supplementary information. If you have any questions, please call the Cross-Connection Info Line at (804) 748-1280, or the Cross-Connection Control Coordinator at the telephone number shown at the top of this page.

BFP Type (Acronym ¹)	Relevant Standard & Number	Pressure Use(s)	Pressure Condition(s)	Degree of Hazard Use	Installation Methods	Typical Use(s) and Remarks
Air Gap (AG)	ANSI ² A112.2.1	Back-siphonage or Backpressure	Continuous	High, Moderate or Low	Two (2) times the diameter of the outlet opening, but never less than one (1) inch.	Sinks, bathtubs, process make-up tanks, residential dishwashers (ASSE ³ 1006) and clothes washers (ASSE 1007). Inspect annually.
Atmospheric Vacuum Breaker (AVB)	ASSE 1001	Back-siphonage	Intermittent (not more than 12 hours continuously)	High or Low	Vertical only; no downstream valves allowed; minimum of 6" above highest downstream piping, fixture, flood level rim, outlet or highest point of water use; not for inside of fume hoods. Deck-mounted AVB allowed 1" above fixture flood level rim or outlet.	Low-flow items such as lab sinks, soap dispensers and appliances not subject to backpressure; do not install where water spillage will be objectionable; spill-resistant type is allowed. Inspect annually and replace as necessary.
Hose Connection Vacuum Breaker (HCVB)	ASSE 1011	Back-siphonage	Intermittent, low head (less than 10 feet)	Low	Device should be locked in place with setscrew; not required on water system drain-down outlet or boiler drain.	Hose bibs or sillcocks; wall hydrants (freeze-proof required for exterior locations); inspect annually; replace every five years.
Dual Check (DC)	ASSE 1024	Back-siphonage or Backpressure	Intermittent, Continuous, low or no flow	Low	Vertical or horizontal	Residential water services; sink spray hoses; inspect annually; replace every five years.
Dual Check with Intermediate Atmospheric Vent (DC/IAV)	ASSE 1012	Back-siphonage	Continuous	Low	Vertical or horizontal; air gap required on vent outlet drain	Residential heating boilers; hot tubs; lab equipment; commercial dishwasher (hot & cold supplies); ice machines; inspect annually; replace every five years.

A GUIDE TO THE SELECTION, INSTALLATION AND MAINTENANCE OF BACKFLOW PREVENTION ASSEMBLIES AND DEVICES FOR COMMERCIAL AND INDUSTRIAL APPLICATIONS (CONTINUED)

BFP Type (Acronym¹)	Relevant Standard & Number	Pressure Use(s)	Pressure Condition(s)	Degree of Hazard Use	Installation Methods	Typical Use(s) and Remarks
Backflow Preventer for Beverage Dispensing Equipment (BFP/BDE)	ASSE 1022	Back-siphonage or Backpressure	Intermittent or Continuous	Low	Vertical or horizontal; no copper pipe downstream of backflow preventer.	Carbonated beverage systems or equipment; tea/coffee makers/dispensers; juice dispensers; frozen beverage makers/dispensers; inspect annually; replace every five years.
Laboratory Faucet Backflow Device (LFBD)	ASSE 1035	Back-siphonage or Backpressure	Intermittent, low or no flow	Low	Vertical	Laboratory sink faucet outlets; other sink applications; inspect annually; replace every five years.
Spill-Resistant Vacuum Breaker (SVB)	ASSE 1056	Back-siphonage	Intermittent	High or Low	Vertical; same installation methods as a standard AVB	Soap dispensers; specialty sinks; cleaning equipment (non-hazardous chemicals); inspect annually; replace every five years.
Pressure Vacuum Breaker (PVB)	ASSE 1020	Back-siphonage	Continuous	High or Low	Vertical; minimum of 12 inches above highest downstream outlet or use.	Lawn irrigation systems (without chemical injection or different zones); degreasing equipment; photo developing tanks; do not install in areas where water spillage will be objectionable; inspect annually; TEST UPON INSTALLATION, REPAIR AND ANNUALLY ⁴ ; overhaul ⁵ every five years.
Double Check Valve Assembly (DCVA) Or Double Check Fire Protection Backflow Prevention Assembly (DCF)	ASSE 1015	Back-siphonage or Backpressure	Intermittent or continuous	Low	Horizontal unless ASSE or FCCCHR ⁶ approved for vertical; minimum of 24 inches and maximum of 48 inches (DCV) and 36 inches (DCF) above finished floor for interior use; minimum of 18 inches & maximum of 24 inches above grade for exterior use.	Food prep or processing washdown hose racks or equipment; large food processing equipment; dry type fire sprinkler systems; inspect annually; TEST UPON INSTALLATION, REPAIR AND ANNUALLY; overhaul every five years.

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BFP Type (Acronym)	Relevant Standard & Number	Pressure Use(s)	Pressure Condition(s)	Degree of Hazard Use	Installation Methods	Typical Use(s) and Remarks
Double Check Detector Fire Protection Backflow Prevention Assembly (DCDF)	ASSE 1048	Back-siphonage or Backpressure	Continuous	Low	Horizontal unless ASSE or FCCCHR approved for vertical; minimum of 24 inches and maximum of 36 inches above finished floor for interior use; minimum of 18 inches and maximum of 24 inches above grade for exterior use.	Dry-type fire sprinkler systems; inspect annually; TEST UPON INSTALLATION, REPAIR AND ANNUALLY; overhaul every five years.
Reduced Pressure Principal Assembly (RP) or Reduced Pressure Zone Assembly (RPZ)	ASSE 1013	Back-siphonage or Backpressure	Continuous	High, Moderate or Low	Horizontal unless ASSE or FCCCHR approved for vertical; minimum of 24 inches and maximum of 36 inches above finished floor for interior use; minimum of 18 inches and maximum of 24 inches above grade for exterior use; . NOT ALLOWED BELOW GRADE.	Facilities per Section 4.5.1; chemical systems; cooling towers; chilled water systems; commercial boilers with chemical addition; commercial or public toilet facilities; swimming pools; certain hospital equipment; solar heating systems; irrigation systems with zones, valves and/or chemical injection; TEST UPON INSTALLATION, REPAIR AND ANNUALLY; overhaul every five years.
Reduced Pressure Detector Assembly (RPD)	ASSE 1047	Back-siphonage or Backpressure	Intermittent; Continuous	High, Moderate or Low	Horizontal unless ASSE or FCCCHR approved for vertical; minimum of 24 inches and maximum of 36 inches above finished floor for interior use; minimum of 18 inches and maximum of 24 inches above grade for exterior use; NOT ALLOWED BELOW GRADE.	Wet-type fire sprinkler systems; inspect annually; TEST UPON INSTALLATION, REPAIR AND ANNUALLY; overhaul every five years.

¹ Acronyms (abbreviations) shown are industry typical. However, they may not reflect those used by others.

² American National Standards Institute.

³ American Society of Sanitary Engineering.

⁴ Minimum requirement.

⁵ Replacement of internal rubber components as a minimum.

⁶ Foundation for Cross Connection Control and Hydraulic Research.